

CLAIMS

What is claimed is:

1. A method of thermally treating a magnetic layer of a wafer, comprising:
5 annealing, for a predetermined short duration, a magnetic layer of a
single wafer.
2. The method of claim 1, wherein said annealing comprises:
 heating an entirety of said single wafer.
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3. The method of claim 1, wherein said annealing comprises:
 heating a local area on the single wafer.
4. The method of claim 1, wherein said annealing comprises:
15 heating said magnetic layer within a range of about 300 to about 500
degrees C.
5. The method of claim 1, wherein said annealing comprises:
 heating said magnetic layer for a duration within a range of about 1
20 second to about 60 seconds.
6. The method of claim 1, wherein said annealing comprises:
 annealing by one of a flash lamp, a laser, a flashlight, a focused heat
lamp, and a rapid thermal anneal (RTA) lamp.

7. The method of claim 1, further comprising:

after said annealing, applying a magnetic field to said magnetic layer.

5 8. The method of claim 7, wherein said applying is performed to align a pinning of the magnetic layer.

9. The method of claim 3, wherein said annealing comprises annealing a desired spot on the single wafer, said method further comprising:

10 performing one of a spot-to-spot processing and a line-to-line processing.

10. The method of claim 1, further comprising:

15 sequentially annealing different areas of the single wafer in different directions.

11. A method for processing a magnetic stack, comprising:

annealing a single wafer having a magnetic stack formed thereon, with a predetermined fast anneal in a presence of a magnetic field.

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12. The method of claim 11, further comprising:

cooling the single wafer by at least one of cooling liquid, helium, nitrogen, argon, and a vacuum.

13. The method of claim 11, further comprising:

annealing only portions of the single wafer at a time.

14. The method of claim 11, further comprising:

5 changing a direction of an applied magnetic field point-by-point.

15. The method of claim 11, further comprising:

annealing multiple separate locations at the same time.

10 16. The method of claim 11, further comprising:

rotating the single wafer and annealing another area of the single wafer
in a different direction.

17. The method of claim 11, further comprising:

15 rotating the field and annealing another area of the single wafer in a
different direction.

18. An apparatus for treating a magnetic layer of a wafer, comprising:

a heating element for annealing, for a predetermined short duration, a
20 magnetic layer on a single wafer; and
a magnet for applying a magnetic field to the magnetic layer during
said annealing.

19. The apparatus according to claim 18, wherein the magnet applies said magnetic field locally to the single wafer.

20. The apparatus according to claim 18, wherein said magnetic field is
5 uniformly applied to said single wafer.

21. The apparatus according to claim 18, wherein said heating element comprises one of a rapid thermal anneal (RTA) lamp, a flash lamp, a laser, a flashlight, and a focused heat lamp.

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22. The apparatus according to claim 18, wherein said heating element performs said annealing within a range of about 300 to about 500°C, and a preferred duration of holding the single wafer at the predetermined temperature is within a range of about 1 second to about 60 seconds.

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23. The apparatus according to claim 18, wherein the heating element performs one of heating a point, a line, and multiple points on said single wafer.

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24. The apparatus according to claim 18, further comprising:
a thermal sensor positioned adjacent a spot on the wafer to be heated.

25. The apparatus according to claim 18, wherein annealing by said heating element and magnetic field scanning by said magnet are simultaneously performed.

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26. The method of claim 11, further comprising:
cooling only portions of the single wafer.

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27. The apparatus according to claim 18, further comprising:
a cooling element for cooling at least a portion of the single wafer.